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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
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DEGHAN, QUEENIE S

ART UNIT	PAPER NUMBER
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1791

MAIL DATE	DELIVERY MODE
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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/648,585

Applicant(s)

DATTA ET AL.

Examiner

Queenie Dehghan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 23, 2007 has been entered.

### ***Information Disclosure Statement***

2. The information disclosure statement filed May 25, 2007 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2 and 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Budd et al. (6,461,988). Budd et al. disclose a microsphere comprising an alkali metal oxide less than about 10% wt based on the weight of the precursor and having an average particle diameter of greater than 30 microns (col. 3 lines 64-66, col. 4 line 49 to col. 5 line 3). Furthermore, Budd et al. disclose providing an agglomerate precursor comprising starting materials which include an aluminosilicate component and at least one binding agent and firing the precursor at a pre-determined temperature to form microspheres having spherical walls (col. 7 lines 22-36, line 59 to col. 8 line 11).
3. Regarding claim 2, Budd et al. teach firing the precursor at a temperature about 1000°C to 1450°C (col. 1 lines 25-27).
4. Regarding claim 6, Budd et al. teach firing the precursor in a fuel fired furnace (col. 8 lines 6-8).

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 5, 8, 9, 11-15, 17-20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (6,461,988) in view of Matthews et al. (3,838,998).
2. Regarding claims 5, 8, 9, 11-15, 19-20, as mentioned in claim 1, Budd et al. disclose providing an agglomerate precursor by combining starting materials such as a

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binder and an aluminosilicate component to form a mixture (col. 7 lines 22-36), but do not offer detail method steps. Matthews et al. disclose a process for forming an agglomerate precursor comprising of mixing aluminosilicate glasses (col. 4 line 37) from feldspar and a binding agent, such as sodium silicate (col. 5 lines 60-63), drying the precursor mixture (col. 7 lines 40-53) to a first moisture level (col. 8 lines 26-28) of less than about 14% (note the range 5 to 15% is less than about 14% in col. 8 lines 13-14), and firing of the precursor to a temperature (col. 10 lines 23-24) sufficient to react the binding agent to form a microsphere having a spherical wall (col. 10 lines 3-6, 44-46) in a heated vertical pipe (col. 9 lines 46-47). The sodium silicate binding agent glassifies at lower temperatures and creates a molten skin around the precursor and interior void of the microsphere (col. 10 lines 3-6, 37-45). Furthermore, Matthews et al. disclose using a blowing agent in the precursor material (col. 5 lines 65-68 to col. 6 lines 1-2) that is activated during the firing step and after the formation of the molten skin (col. 12 lines 51-56) so as to trap the blowing gas, such as CO<sub>2</sub> and H<sub>2</sub>O (col. 6 lines 9-11) inside the molten skin (col. 5 lines 52-53) and release a blowing gas to expand the precursor and forming an enclosed void in the precursor (col. 5 lines 54-57, col. 10 lines 37-45), hence forming microspheres. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the specific method steps of Matthews in the process Budd et al. in order to achieve the large diameter microspheres desired.

3. Regarding claim 17, Budd et al. teach firing the precursor at a temperature about 1000°C to 1450°C (col. 1 lines 25-27).

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4. Regarding claim 18, both Budd et al. and Matthews et al. disclose rapidly cooling the microspheres after the firing step (col. 8 lines 12-14, col. 11 lines 39-40 respectively).

5. Regarding claim 23, Matthews et al. disclose a drying step to reduce moisture of the precursor (col. 7 lines 49-53) and expansion of the precursor can be attributed to the steam in the feed particle (col. 16 lines 10-11). Matthews et al. also mention that rupturing of the precursor will occur if expansion is too fast or too much (col. 12 lines 63-65). Because water is a major contributor to the expansion of the precursor, too much water would result in excess rupturing. Since Matthews et al. perform a drying step to the precursor to reduce the moisture content, having less water in the precursor would inherently reduce the rupturing of the precursor.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (6,461,988), as applied to claim 1 above, in view of Seki et al. (JP Abstract 07024299). Budd et al. disclose a fuel fired furnace, but do not disclose using a fluidized bed reactor. Seki et al. teach producing microspheres, wherein the firing step is performed in a fluidized bed reactor (abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the fluidized bed reactor of the Seki et al. in the process of Budd et al. in order to supply heat to the precursor.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable Budd et al. (6,461,988), as applied to claim 1 above, in further view of Aston et al. (4,475,936). Budd et al. disclose a fuel fired furnace, but do not disclose using a vortex furnace that is fuel

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fired. Aston et al. teach a vortex furnace (abstract) that is fuel-fired (col. 1 line 52) and is use to fire up glass particulates into spherical shapes (col. 1 lines 13-18). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the fuel-fired vortex furnace of Aston et al. in the process of Budd et al. to supply rapid heating of the glass particles.

8. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (6,461,988) in view of Matthews et al. (3,838,998), as applied to claims 2 and 9 above, in further view of Veatch et al. (2,978,340). Budd et al. and Matthews et al. disclose a process for manufacturing microspheres, but do not disclose a firing period of 0.05 to 20 seconds and activating the blowing agent during the formation of the molten skin. Regarding claim 7, Veatch et al. teach making microspheres by firing the precursor for 2 seconds (col. 4 lines 60-61). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the firing period of Veatch et al. in the process of Budd et al. and Matthews et al. to ensure enough time to adequate fuse and expand the particles, as taught by Veatch et al. Regarding claim 10, Veatch et al. teach of activating the blowing agent during the formation of the molten skin (col. 1 lines 33-37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the activation step of Veatch et al. in the process of Budd et al. and Matthews et al. in order to allow for the expansion of the microsphere.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (6,461,988) in view of Matthews et al. (3,838,998), as applied to claim 15 above, in

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further view of Kizilshtein et al. (English translation of SU 1650196 abstract) and Yamada et al. (2001/0043996) and Brown et al. (4,235,753). Budd et al. and Matthews et al. disclose a process for manufacturing microspheres, but do not disclose sources for the aluminosilicate, binding agent and blowing agent. Kizilshtein et al. teach of aluminosilicate microspheres made from fly ash (abstract). Yamada et al. teach using silicon carbide as a blowing agent ([0052]). Brown et al. teach using sodium hydroxide with aluminosilicate to form zeolites (col. 5 lines 48-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the aluminosilicate from fly ash, silicon carbide as a blowing agent, and a hydroxide binding agent as taught by the reference above in the process of Budd et al and Matthews et al. in order to utilize the availability of the fly ash resources, to generate the gas needed to expand the microsphere, as taught by Yamada et al., and to have a thermally stable binder and allow for access of the gases, as taught by Brown et al. (col. 1 lines 28-31).

10. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (6,461,988) in view of Matthews et al. (3,838,998), as applied to claim 13 above, in further view of Netting (3,888,957). Budd et al and Matthews et al. disclose a process for manufacturing microspheres, but do not disclose a drying temperature of 50°C. Netting teach of two drying steps where hollow spheres are dried at a temperature of about 50°C and then further dried at a raised temperature about 400°C (col. 5 lines 30-31). Netting teach an example where the particle was dried at 100°C and then 300°C, which is interpreted to be about the claimed temperatures, according to specification disclose by the applicant on page 21, [0087]. It would have

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been obvious to one of ordinary skill in the art at the time the invention was made to utilize the drying temperatures of Netting in the process of Budd et al. and Matthews et al. in order to remove the proper amount of moisture, as taught by Netting.

11. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Budd et al. (6,461,988) in view of Matthews et al. (3,838,998) and Veatch (2,978,340). Budd et al. disclose providing an agglomerate precursor comprising starting materials which include an aluminosilicate component and at least one binding agent and firing the precursor at a pre-determined temperature of about 1000°C to 1450°C to form microspheres having spherical walls, an internal void, (col. 7 lines 22-36, line 59 to col. 8 line 11, col. 1 lines 26--27) and an alkali metal oxide less than about 10% wt based on the weight of the precursor (col. 3 lines 64-66, col. 4 line 49 to col. 5 line 3). However, Budd et al. fail to disclose a blowing agent and drying the mixture. Matthews et al. disclose a method for forming microspheres comprising:

- a. Providing an agglomerate precursor comprising an aluminosilicate component, which naturally would have a preselected size (col. 4 line 37), a blowing agent, and a binding agent (col. 5 lines 60-68), with water to form a homogenous mixture (col. 7 lines 29-44); and
- b. Drying the mixture to form agglomerate precursor (col. 7 lines 49-53); and
- c. Firing the precursor at a temperature greater than 800°C (col. 10 line 24) and time to activate the blowing agent to release gas, thereby forming microspheres with an internal void (col. 10 lines 37-45).

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12. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the specific method steps of Matthews in the process Budd et al. in order to achieve the large diameter microspheres desired. Matthews et al. further disclose the firing time as very short (col. 1 lines 4-6), but does not disclose a specific amount of time. Veatch et al. teach a firing time of less than 20 seconds (col. 4 lines 40-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the firing time of Veatch et al. in the process Budd et al. and Matthews et al. in order to adequately fuse the and expand the hollow spheres.

### ***Response to Arguments***

5. Applicant's arguments with respect to the combination of Matthews and Matsubara et al. have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Queenie Dehghan whose telephone number is (571)272-8209. The examiner can normally be reached on Monday through Friday 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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